LM1 Protocol Analyzer

PC-Based, low cost, flexible and easy to use

The LM1 Protocol Analyzer is an easy to use PC-based data analysis tool. It combines the flexibility of personal computers with a protocol analyzer that keeps your test equipment budget in check. In the shop and in the field the LM1 offers fast data line troubleshooting.

The LM1 takes full advantage of its PC platform. Just plug the LM1 into one of the slots in any IBM PC, XT, or AT compatible desktop portable or

laptop computer, load the software, and you're up and running. Pop-up menus simplify use. For the non-technical operator, the LM1 offers automatic configuration. The function-key driven format and familiar PC keyboard permit fast command input and operation. Context-sensitive help shortens the learning curve, and adds to productivity.

The LM1 also takes advantage of the PC monitor for a screen display showing up to 1,600 characters. EGA and VGA capabilities, including user-defined color palettes, offer enhanced screen displays.

Portability and Remote Operation

The LM1 is a protocol analyzer with a lot of get up and go. The half-slot card fits in any IBM-compatible laptop. Typically, the whole package weighs less than 15 pounds. You get maximum portability so you can zero in on problems in the shop or in the field.

The remote option lets you monitor off-site lines.

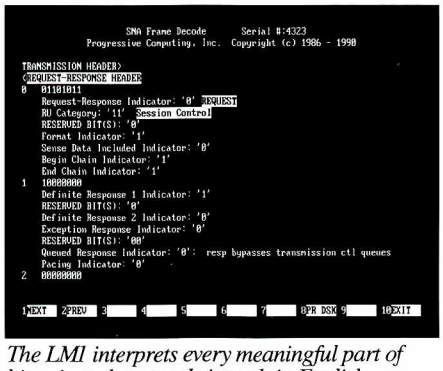
The LM1 Protocol Analyzer:

- Monitors data for RS-232, V.35, V.10, V.11
- Supports X.25, SNA, QLLC, Q.931, and other protocols
- Interprets every meaningful part of bit-oriented protocols
- Continuously monitors data while in review mode
- Displays twice as much data as stand-alone analyzers
- Logs to the PC's disk for off-line analysis
- Protocol trace selectively displays captured data
- Supports flow control for BERT
- Makes test building simple even for nonprogrammers via the PowerScript Custom Test Builder
- Provides easy-to-use selection menus
- Offers laptop portability
- Includes context-sensitive help
- Optional BASIC and C

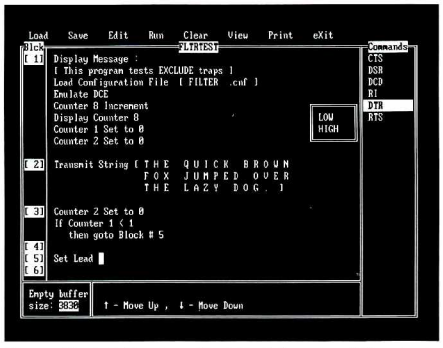
Analysis in Plain English

The LM1 gives you easy-to-read decodes spelled out in plain English, using the exact language from the standards for X.25, SNA, QLLC, and Q.931 protocols. Every bit and byte in a frame is spelled out, and key interpretations are highlighted so they are easy to see.

Trace functions make problem isolation easy. You can collect data to disk, then select discreet segments of that data for analysis.


SNA Frame Decode
Progressive Computing, Inc. Copyright (c) 1986 - 1990
TRANSMISSION HEADER>
<REQUEST-RESPONSE HEADER
0 01101011
Request-Response Indicator: '0' REQUEST
RU Category: '11' Session Control
RESERVED BIT(S): '0'
Format Indicator: '1'
Sense Data Included Indicator: '0'
Begin Chain Indicator: '1'
End Chain Indicator: '1'
1 10000000
Definite Response 1 Indicator: '1'
RESERVED BIT(S): '0'
Definite Response 2 Indicator: '0'
Exception Response Indicator: '0'
RESERVED BIT(S): '00'
Queued Response Indicator: '0': resp bypasses transmission ctl queues
Pacing Indicator: '0'
2 00000000
1NEXT 2PREV 3 4 5 6 7 8PR DSK 9 10EXIT

The LM1 interprets every meaningful part of bit-oriented protocols into plain English.



PowerScript Custom Test Builder simplifies test procedures and simulations.

Simplified Programming

PowerScript is an easy-to-use interactive custom test builder that adds power and flexibility to protocol analysis. With PowerScript, context-sensitive look-ahead windows show upcoming menu selections. A library of ready-to-use test scripts provides off-the-shelf programs that you can modify or use immediately. Optional BASIC and C are available for more advanced programming.

PC-based Productivity

The LM1 takes full advantage of its PC platform. Dual tasking allows you to leave the LM1 resident while you use DOS commands. You can use your existing PC software to improve productivity.

Because all of the data can be logged to standard DOS files (not vendor-specific diskettes or tapes), the data, once captured, can be analyzed on any PC, even without the LM1 board installed.

A built-in async terminal emulator lets you upload and download files using XMODEM terminal emulation.

Automatic BERT/BLERT

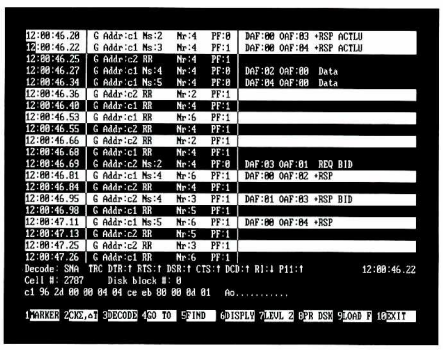
Full-featured BERT/BLERT tests for noise or impairment on your data communication line. The LM1 also features automatic report printout.

The soft break-out box on screen shows real-time lead display and pulse detection. It also lets you set modem lead states.

LM1

Display:

- Up to 1600 mnemonic characters can be displayed using standard EGA or VGA monitor
- Any IBM PC compatible color, monochrome or graphics display can be used
- Data Display Modes: Mnemonic, Level 2, Level 2&3, Level 3 Information (Frame, Character, Hexadecimal), Hexadecimal, Character
- Formats: Full Duplex, Half duplex, Data/Modem Lead State Display (an oscilloscope-like trace showing modem lead states)


12:00:46.28 | G Addr:c1 Ns:2 Nr:4 PF:0 | DAF:00 OAF:03 +RSP ACTLU
12:00:46.22 | G Addr:c1 Ns:3 Nr:4 PF:1 | DAF:00 OAF:04 +RSP ACTLU
12:00:46.25 | G Addr:c2 RR Nr:4 PF:1
12:00:46.27 | G Addr:c1 Ns:4 Nr:4 PF:0 | DAF:02 OAF:00 Data
12:00:46.34 | G Addr:c1 Ns:5 Nr:4 PF:0 | DAF:04 OAF:00 Data
12:00:46.36 | G Addr:c2 RR Nr:2 PF:1
12:00:46.40 | G Addr:c1 RR Nr:4 PF:1
12:00:46.53 | G Addr:c1 RR Nr:6 PF:1
12:00:46.55 | G Addr:c2 RR Nr:4 PF:1
12:00:46.66 | G Addr:c2 RR Nr:2 PF:1
12:00:46.68 | G Addr:c1 RR Nr:4 PF:1
12:00:46.69 | G Addr:c2 Ns:2 Nr:4 PF:0 | DAF:03 OAF:01 REQ BID
12:00:46.81 | G Addr:c1 Ns:4 Nr:6 PF:1 | DAF:00 OAF:02 +RSP
12:00:46.84 | G Addr:c2 RR Nr:4 PF:1
12:00:46.95 | G Addr:c2 Ns:4 Nr:3 PF:1 | DAF:01 OAF:03 +RSP BID
12:00:46.98 | G Addr:c1 RR Nr:5 PF:1
12:00:47.11 | G Addr:c1 Ns:5 Nr:6 PF:1 | DAF:00 OAF:04 +RSP
12:00:47.13 | G Addr:c2 RR Nr:5 PF:1
12:00:47.25 | G Addr:c2 RR Nr:3 PF:1
12:00:47.26 | G Addr:c1 RR Nr:6 PF:1
Decode: SNA TRC DTR:↑ RTS:↑ DSR:↑ CTS:↑ DCD:↑ RI:↓ P11:↑ 12:00:46.22
Cell 0: 2707 Disk block 0: 0
c1 96 2d 00 00 04 04 ce eb 00 00 0d 01 Ao.....
1MARKER 2CNE,aT 3DECODE 4GO TO 5FIND 6DISPLY 7LEVL 2 8PR DSN 9LOAD F 10EXIT

The logical presentation of levels 2 & 3 help interpret captured data.

Analysis:

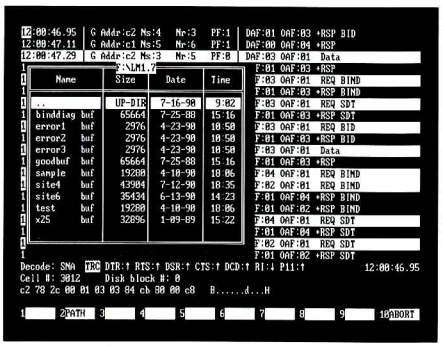
- Number of characters, errors reported in real-time
- Elapsed time and summary information reported automatically in buffer. review mode. No programming required
- TX and RX line configurations independently selectable, for checking protocol converters
- PowerScript Custom Test Builder makes powerful, customized test routines easy to write
- Experienced programmers may choose an optional PCI BASIC or C library interface

BERT/BLERT:

- Modem or XON/XOFF flow control
- 9 patterns: FOX (ASCII or EBCDIC); pseudorandom 63, 511, or 2047; Alternating 01, Mark, Space or user defined — or emulation message
- Block sizes: 256, 512, 1K, 2K, 3K, 5K bits or CCITT/length of pattern
- Async flow control, XON/XOFF or modem leads
- Communications Mode: Async (5, 6, 7, 8 bits) or Sync
- 50 bps to 19.2 KBPS (same as monitor)
- Emulate DCE or DTE
- Report via printout or log to disk on error, completion, both, or every 1, 5, 10, 30 or 60 minutes
- Screen reports injected error count, total bits and blocks transmitted/ received, errors received, calculated bit and block error rates, sync lost count, not synced time, total run time, error free rate

General features:

- Familiar look, feel and keyboard of industry standard personal computer
- DOS compatible, captured data can be viewed on any PC
- LAN compatible. When installed on a file server, accessible from multiple stations
- Line configuration files can be saved and subsequently loaded from startup
- Dual tasking — leave LM1 running while you execute DOS commands such as DIR, COPY, or other programs such as a communications package (DOS 3.0 or higher recommended)
- Autoconfiguration to line speed, protocol, character set
- Context sensitive help


12:00:46.95 | G Addr:c2 Ns:4 Nr:3 PF:1 | DAF:01 OAF:03 +RSP BID
12:00:47.11 | G Addr:c1 Ns:5 Nr:6 PF:1 | DAF:00 OAF:04 +RSP
12:00:47.29 | G Addr:c2 Ns:3 Nr:5 PF:0 | DAF:03 OAF:01 Data
\LM1.d
Name Size Date Time
.. UP-DIR 7-16-90 9:02
binddiag buf 65664 7-25-88 15:16
error1 buf 2976 4-23-90 10:50
error2 buf 2976 4-23-90 10:50
error3 buf 2976 4-23-90 10:50
goodbuf buf 65664 7-25-88 15:16
sample buf 19200 4-10-90 10:06
site4 buf 43904 7-12-90 10:35
site6 buf 35434 6-13-90 14:23
test buf 19200 4-10-90 10:06
x25 buf 32896 1-09-89 15:22
F:01 OAF:03 +RSP
F:03 OAF:01 REQ BIND
F:01 OAF:03 +RSP BIND
F:03 OAF:01 REQ SDT
F:01 OAF:03 +RSP SDT
F:03 OAF:01 REQ BID
F:01 OAF:03 +RSP BID
F:03 OAF:01 Data
F:01 OAF:03 +RSP
F:04 OAF:01 REQ BIND
F:02 OAF:01 REQ BIND
F:01 OAF:04 +RSP BIND
F:01 OAF:02 +RSP BIND
F:04 OAF:01 REQ SDT
F:01 OAF:04 +RSP SDT
F:02 OAF:01 REQ SDT
F:01 OAF:02 +RSP SDT
Decode: SNA TRC DTR:↑ RTS:↑ DSR:↑ CTS:↑ DCD:↑ RI:↓ P11:↑ 12:00:46.95
Cell 0: 3012 Disk block 0: 0
c2 78 2c 00 01 03 03 04 cb 00 00 c8 B.....d...H
1 2PATH 3 4 5 6 7 8 9 10ABORT

A load file function incorporates a drop-down menu that displays only the relevant files, and allows the user to load files via cursor selection.

Standard Software:

- Layer 2 frame decode for SDLC/ HDLC, DDCMP and LAPD-ISDN
- PowerScript Custom Test Builder allows custom test procedures and simulations to be easily written
- Bit and Block Error Rate Testing
- Built-in software break-out box
- Built-in async terminal emulation using XMODEM file transfer

Software Options:

- Optional software adds Layer 3 for SNA, X.25, QLLC, and ISDN Q.931
- Remote operation for analyzing off-site lines via modem-to-modem connection, with all capabilities supported and dialback password security
- C Programmers' Tool Kit for custom analysis and simulations uses off-the-shelf compilers from Borland, Lattice and Microsoft
- BASIC programming language for custom analysis and simulations in an industry standard BASIC language, enhanced for communications programming

Protocol Analyzer

Operating Characteristics

Protocols:

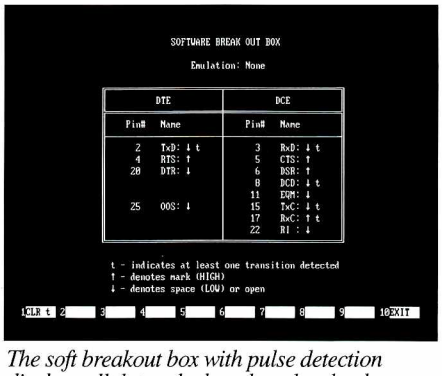
X.25/X.75, SNA, QLLC, HDLC, SDLC, Bisync, DDCMP, TRANSD, async and ISDN including Q.931 generics for CCITT, AT&T, Northern Telecom, Siemens, German, French and Australian. AT&T X.25 on SAPI 0 is also supported

Speeds:

50 bps to 19.2 kbps standard operation, higher speeds dependent upon PC

Data Communications Modes:

Asynchronous, Byte and Bit Synchronous, Frame-NRZ, Internal/ External clock independently selectable from configuration screen



The soft breakout box with pulse detection displays all data, clock and modem leads.

Character Sets:

ASCII, EBCDIC, User, Baudot, IPARS0, IPARS1. *Data Bits:* 5, 6, 7, or 8. *Parity:* None, Even, Odd, or Ignore

Error Checking:

CRC-16, CRC-CCITT

Modem Leads Monitored:

DTE: DTR, RTS, *DCE:* DSR, CTS, DCD, RI. *Lead changes kept in buffer:* DCD, RI, DSR, CTS, DTR, RTS, pins 11 and 25

Time Stamping:

Each character and modem lead change is time stamped as it is placed in the buffer. Timer resolution is about 500 microsec

Buffer:

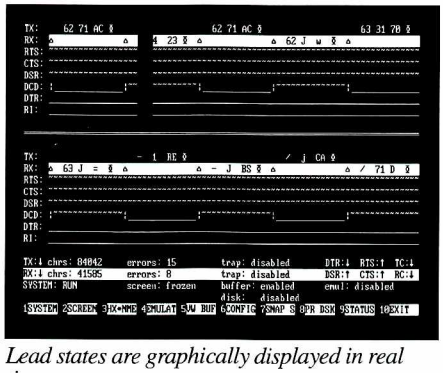
Capacity: PC dependent. RAM buffer stores 32K characters. Mass storage extends buffer limit to PC's disk capacity. Disk wrap feature allows user to specify buffer size, and LM1 will rewrite buffer continuously while monitoring, saving only the most recent data

Hardware description:

- One half-slot line interface circuit board with RS-232 interface, fits in standard PC-XT/AT bus slots
- One 3-way flat ribbon RS-232 cable
- Optional V.35 monitor/transmit interface pod

System Requirements:

- IBM PC/XT, AT or compatible, AT and hard disk recommended
- 512K bytes memory minimum, 640K recommended
- One free half-size 8 or 16 bit expansion slot (for line interface card)
- DOS version 2.1 or higher, 3.0 or higher recommended
- Free i/o address (200H or 300H)
- Any available interrupt vector



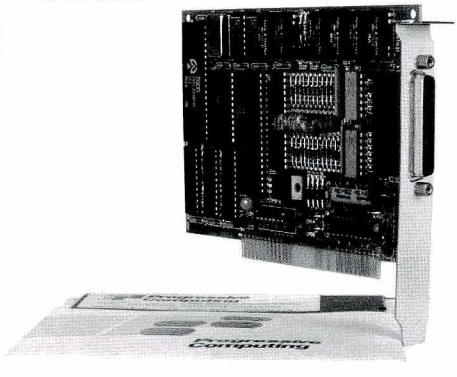
Lead states are graphically displayed in real time.

Interface Options:

- Standard RS-232 and Mil 188 on-board (requires no pod)
- V.35/V.10/V.11 Interface Pod with LED display of clock and data leads

Warranty:

- Limited one year parts and labor warranty
- Free loaner if unit requires service
- Free telephone support
- One year free software updates
- 15 day free trial
- Optional 1-year or 3-year warranty extension



The LM1 combines the portability of personal computers with a powerful protocol analyzer.

Progressive Computing — New Visions in Communications

Progressive Computing was founded to create PC-based equipment that provides alternatives to the expense and limitations of dedicated test and communications instruments.

For more information about the LM1 Protocol Analyzer call us at 708/574-3399.

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Oak Brook, IL 60521-1919 U.S.A.
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(708) 574-3688

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CompaSS7™

A multi-line network analyzer designed for SS7 applications

The CompaSS7 multiline SS7 network analyzer meets the growing need for monitoring and analyzing SS7 protocol and link set performance. Developed for in-service monitoring of SS7 traffic, CompaSS7 is ideally suited for central office and non-intrusive STP applications. And because it is PC-based, the CompaSS7 is cost effective and easy to use.

Four 64KB links at 100% utilization can be monitored within an SS7 link set. Complete decoding of all SS7 protocol parts is provided. Moreover, CompaSS7 helps users sort through the complex patterns of traffic using a sophisticated array of filtering and decode viewing tools.

Data Monitoring and Analysis

CompaSS7 interprets and displays every meaningful bit in every byte in the complex SS7 protocol. All layers of the protocol are decoded in a logical and easy-to-read form, using plain English right from the standards. Decodes can be displayed as layer two and above, layer three and above, or as layer four and above. Both frame and decode views can be changed while capturing data. All standard user parts such as TCAP are decoded so that complete data about SS7 services can be tracked.

CompaSS7 gives the user individual control over four display formats at frame and decode levels. The frame view of SS7 packets can be displayed as hex, layer two, layer three, layer three and above, or as layer four and above.

CompaSS7

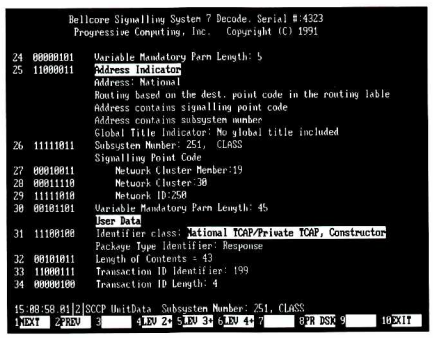
- Monitors up to four 64KB SS7 links at 100% utilization
- Flexible frame and decode displays show data clearly
- Precapture filtering captures only relevant data
- FISU and LSSU filtering includes duplicate counts
- Postcapture filters allow selective viewing of captured data
- Statistics include link set histograms and MSU and IAM traffic level trends
- Remote option allows control from distant CO, STP or other sites
- Lunchbox packaging offers portability
- Familiar PC platform adds flexibility
- Context-sensitive help reduces learning curve

PowerView lets users analyze layer 2 and layer 3 plain English decodes of SS7 traffic in real time while continuing to monitor data. Users may examine the most recent frames in a data stream while continuing to capture data.

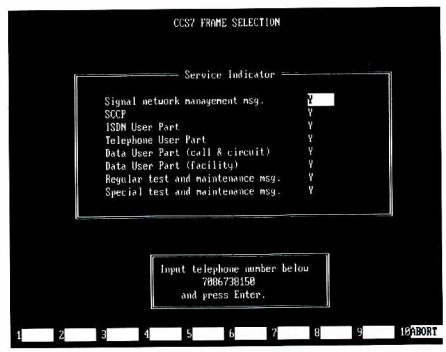
Sophisticated Traps and Filters

CompaSS7 offers a sophisticated array of filtering and decode viewing tools to help users sort through the complex patterns of SS7 traffic. *Call trace*, for example, automatically sets traps and filters on all monitored lines, capturing all packets associated with a single called- or calling-party phone number.

A versatile *precapture filtering* capability lets users select frames in many different ways so that only the relevant information is captured. For example, FISUs and LSSUs can be automatically filtered when only higher-level messages need to be captured and analyzed. A unique *duplicate* option counts the number of consecutive identical FISUs. Additional precapture filters let the user include or exclude frames based on SIO, ISUP, SCCP, routing labels, and management messages. Filters can also be based on user-defined trap strings that can be saved and recalled for future use.


Bellcore Signalling System 7 Decode. Serial #:4323
Progressive Computing, Inc. Copyright (C) 1991
24 00000101 Variable Mandatory Parm Length: 5
25 11000011 Address Indicator
Address: National
Routing based on the dest. point code in the routing table
Address contains signalling point code
Address contains subsystem number
Global Title Indicator: No global title included
26 11111011 Subsystem Number: 251, CLASS
Signalling Point Code
27 00010011 Network Cluster Member:19
28 00011110 Network Cluster:30
29 11111010 Network ID:250
30 00101101 Variable Mandatory Parm Length: 45
User Data
31 11100100 Identifier class: National TCAP/Private TCAP, Constructor
Package Type Identifier: Response
32 00101011 Length of Contents = 43
33 11000111 Transaction ID Identifier: 199
34 00000100 Transaction ID Length: 4
15:08:58.01|2|SCCP UnitData Subsystem Number: 251, CLASS
1NEXT 2PREV 3 4LEV 2+ 5LEV 3+ 6LEV 4+ 7 8PR DSK 9 10EXIT

Plain English decodes include User Parts and TCAP.


CCS7 FRAME SELECTION
Service Indicator
Signal network management msg. Y
SCCP Y
ISDN User Part Y
Telephone User Part Y
Data User Part (call & circuit) Y
Data User Part (facility) Y
Regular test and maintenance msg. Y
Special test and maintenance msg. Y
Input telephone number below
7806738150
and press Enter.
1 2 3 4 5 6 7 8 9 10ABORT

Call trace captures all packets associated with specified telephone number.

Comprehensive SS7 Statistics

CompaSS7 displays 38 important statistics to help analyze SS7 network performance and usage. Link-level, ISUP, MSU, cause of release, and call count statistics can be presented in easy-to-read formats. For example, histograms show link and link-set occupancy. Graphical trend analysis depicts MSU and IAM traffic levels over time.

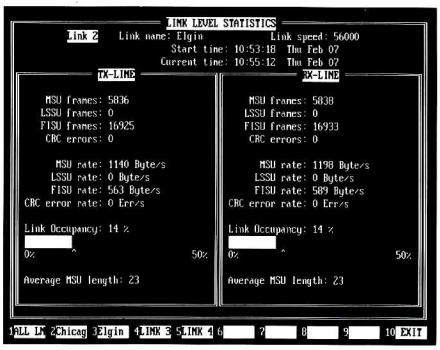
CompaSS7™

PC-based power and flexibility

CompaSS7 is designed to take full advantage of the latest generation of PC technology. Each internal line interface card has its own on-board processor offering unsurpassed performance.

Virtual memory allows the user to determine buffer size which is limited only by the available disk space. The stream-to-disk function allows capture and off-line analysis of data.

The function-key driven format and familiar PC keyboard permit fast command input and operation. Context-sensitive help shortens the learning curve and adds to productivity. CompaSS7 also takes advantage of its VGA PC monitor, showing up to 1,600 characters.



CompaSS7 statistics show network performance.

Portability and Remote Operation

Packaged in a powerful lunchbox computer, CompaSS7 offers the maximum in portability, weighing less than 22 pounds. A CompaSS7 at a distant central office, STP or other remote site can be controlled from any PC equipped with CompaSS7 remote option. Once captured, data can be analyzed on any PC.

Powerful WAN Options

CompaSS7 need not be limited to SS7 network analysis. The wide area network option lets you analyze X.25, SNA, QLLC, Q.931 and other protocols, monitoring data at 72KB. The ISDN option provides on-board hardware interfaces and software tailored for ISDN testing. B- and D-channel analysis capabilities include interactive simulation and real-time layer 2 and layer 3 display.

Both WAN protocol analyzer options include real-time layer 2 & 3 display, flexible precapture and review filtering, interactive custom test builder, and unparalleled packet decode capabilities.

Buffer

64KB RAM buffer

Virtual memory extends buffer size to available hard disk space.

Stream-to-disk stores buffer data to user-named files for off-line analysis

Snapshot saves screen images to disk for later review

"Disk status" box gives total free space, available blocks, and blocks per second given current average SS7 loading.

Traps and filters

"Call trace" feature tracks and stores all SS7 packets containing phone number information within ISDN user parts. Complete or partial phone information anywhere within the ISUP packet is tracked.

All traps and filters individually can be set on TX or RX.

All traps and filters can be set on one, many or all links within an SS7 link set.

Menu-driven traps and filters can be set in four functional categories:

Service Indicator filters
- Signal network management message
- SCCP
- ISDN User Part
- Telephone User Part
- Data User Part (call & circuit)
- Data User Part (facility)
- Regular test and maintenance message
- Special test and maintenance message

Routing Labels filters
- By destination and/or origination address (individually by network identifier, network cluster, network cluster member)
- By Signalling Link Selection
- May be selected individually by TX or RX
- User definable lookup database for translation of addresses into English
- Network member descriptions

Management messages filters
- Change over/change back
- Emergency changeover
- Transfer-controlled, congestion
- Transfer-prohibit, allowed, restricted
- Signalling-route-set-test
- Management inhibiting
- Signalling-data-link-connect

SCCP messages
- Connection Request
- Connection Confirm
- Connection Refused
- Released
- Release Complete
- Data form 1
- Data form 2
- Data Acknowledgment
- Unitdata
- Unitdata Serv.
- Expedited Data
- Expedited Data Acknowledgment
- Reset Request
- Reset Confirmation
- Error
- Inactivity Test

ISDN User Part filters

- Any packet type
- User selectable display of up to forty-four different packets

Manual trap string definitions allow users to build-up custom traps. Entry by character, hex, octal, bits, BCD, "don't care". Separate manual traps by TX and RX; at start of frame, or "anywhere" within frame.

Trap actions:

Include only, count, exclude only.

FISU filters:

User selectable on/off plus "duplicate" summarizes in single packet consecutive FISUs in groups of up to 254.

LSSU filters:

User selectable on/off plus "duplicate" summarizes in single packet consecutive LSSUs of same type in groups of up to 254.

A multi-line network analyzer designed for SS7 applications

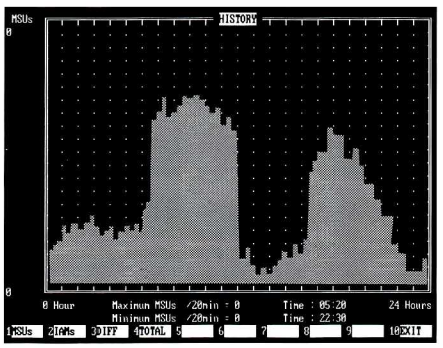
Statistics

Link level
- Analysis by any link or entire link set
- All counts and rates by TX and RX.
- Counts: MSU, LSSU, FISU frames, crc errors
- Rates: MSU, LSSU, FISU frames in bytes/second, crc errors (errors/sec) Link occupancy rate: % MSU bytes against specified baud rate
- Average MSU length in bytes

Summary statistics
- MSU: total, current sample, average/sample; total originated/ terminated, current sample originated/terminated, average originated/terminated
- Call statistics: total IAMs, IAM/minute (current sample), average IAM/sec
- Total release completes, total busy calls, total calls in progress

ISUP Count Statistics Display contains up to forty-four user selectable ISUP message types.

Cause Code Statistics Display contains up to forty-four user selectable Release cause code messages.



Histograms show link and link-set occupancy.

Histograms:
- MSUs/period, IAMs/period
- Scaled by one hour or twenty-four hours.

Data display features

Trap count display

"On the fly" display format change
Error display count
Character display count
Trap status display including call trace stages

Data display modes

Hex, Level 2/3 (time stamp, link number, BSN, FSN, DPC, OPC, SLS) Level 3/4 (time stamp, link number, DPC, OPC, SLS, Layer 4 mnemonic abbreviation) Level 4+ (time stamp, link number, extended description layer 4)

Decode display modes

Display All - uses full language direct from specification
Layer 3+ (suppress layer 2 display)
Layer 4+ (suppress layer 2 and 3 display)

Review modes

All display modes by individual link or link set
Displays extended link name description (defined by user)
Search buffer by marker, trap, cell, disk block, time, next time, snapshot, string search
Elapse time calculation including effective baud rate; TX and RX, byte and message count
Review filters display only desired SS7 packets (see traps for specifics on available review filters)

User Customized features

- Color display
- ISUP statistics count screen
- Release cause code screen
- Link name
- Destination and origination point code data base translations

Decodes

Bellcore (NPL-000-246), and all TCAP TRs
CCITT (Blue book 1988)

SS7 Performance Specs

Up to four SS7 links in an SS7 link set
Each link specified for full loading at 64KB
User rates up to 64KB

Computer specification

IBM PC-AT compatible computer
12 megahertz 80286 microprocessor
1M byte RAM
40 megabyte hard disk
3.5 floppy disk drive.
PCDOS operating system version 3.1 or higher
Electroluminescent (EL) VGA monitor display 640x480 red on black plasma.
86-key keyboard, 10-key numeric/ cursor keypad, 12 programmable function keys, LED indicators for CPA LOCK, NUMLOCK, SCROLL LOCK Keys
200w power supply
RGB, VGA port, two serial ports (RS232), one parallel port.
Two high-performance SS7 line interface cards for two-link monitoring with RS232 interface.
22 lbs in two-link configuration

Line interface cards

Full length card for XT/AT ISA bus personal computer
Requires one i/o address selected from: 200, 240, 280, 2C0, 300, 340, 380, 3C0
Requires 16K shared memory segment selected from addresses: A000, A400, A800, AC00, D000, D400, D800, DC00
Contains 80186 microprocessor running at 16mhz

Options

100 megabyte hard disk
80386SX, or 80386 microprocessor for PC
Carrying case
Remote control option
V.35, V.10, V.11 interface pod
T1 (DS0) interface pod
General purpose protocol analysis option for X.25, SNA, and QLLC analysis
ISDN monitor option for Q.931, Q.921, X.25, SNA, and QLLC analysis

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PA1 Performance Analyzer

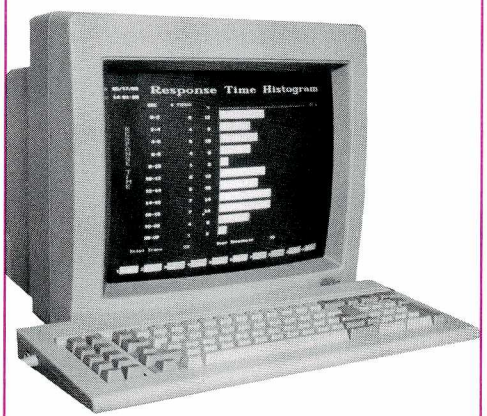
PC-Based Analysis Tool Measures 35 Key Data Line Parameters

Together with Progressive Computing's protocol analyzers, the PA1 Performance Analyzer completes the package for data line management and analysis. The PA1 provides a comprehensive analysis of traffic and line utilization from data captured by the LM1 Olympic Edition, ISDN tel/***scope*** and LM1 protocol Analyzers. The PA1 is also available in a stand-alone configuration.

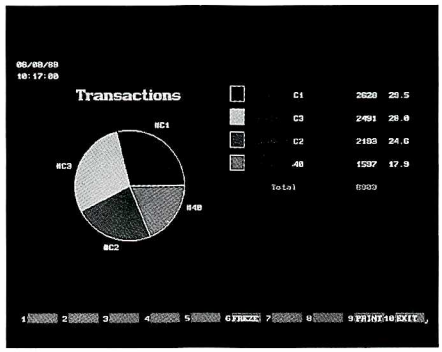
Sophisticated histograms, pie charts and line graphs give you a clear picture of data line utilization and transaction response times. With the PA1, you can quickly spot overloaded equipment or under-used capacity.

The PA1 tracks 35 key performance parameters automatically. Time-lapse playback gives you a quick overview of past events. ASCII files can be created for storing summaries. Data can be shared easily with popular spreadsheet and data base applications as well as with other PCs. Five different types of reports can be printed on dozens of standard printers.

The PA1 helps you plan network evolution, analyze network changes and diagnose contention problems. It measures data line utilization by network device or type of transaction and lets you generate departmental billing easily. PC-based platform makes ad hoc monitoring easy and frees up expensive mainframe capacity.



PC-based PA1 offers large-screen readability. Easy-to-use, it also lets you do sophisticated monitoring without tying up mainframe capacity.



Pie chart shows total number of transactions by cluster

Parameters analyzed:

- Line utilization
- Effective baud rate
- Average total response time
- Average host resident time
- Highest response time, with time and date of occurrence
- Response time histogram with 11 user-definable intervals
- Total number of transactions
- Over-threshold transactions: date, time-of-day, host time, total response time, terminal address and transaction ID
- Rejects with date, time-of-day and node address
- Average poll list wrap time
- Response times, trend over time
- Effective baud rate, host and remote
- X.25 logical channel usage
- X.25 link-level and packet-level exception reports
- X.25 call completion reports

Levels of data line monitoring supported:

- All stations
- Cluster, node or most significant byte
- Logical unit, device or least significant byte
- Software transaction ID

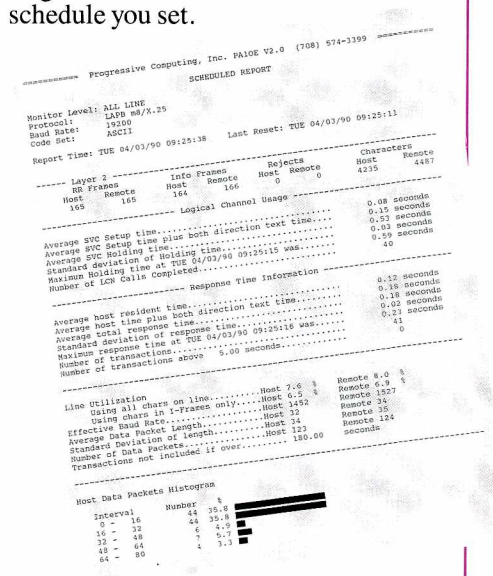
Protocols supported:

- SNA
- X.25
- IBM Bisync
- Burroughs Poll Select

Standard reports:

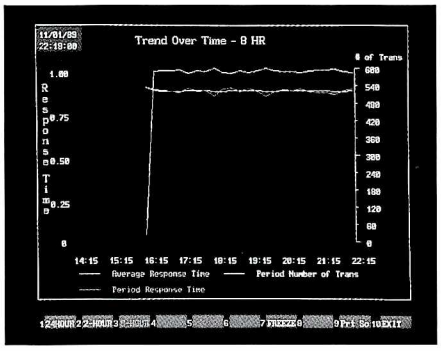
- Status Reports confirm analyzer configuration
- Summary Reports show line utilization, total response time
- Trend Over Time Reports show 2, 8 or 24 hour trend
- Response Time Histograms breakdown transaction performance
- Subunit Reports identify problem equipment
- Network Load Distribution Charts use pie charts for easy analysis
- Over-Threshold Reports list out-of-spec events with or without audible alarms
- Negative Acknowledgement (NAK) Reports track rejected frames

All reports except Trend-Over-Time, Over-Threshold and NAK Reports can be generated on demand or on a schedule you set.


Progressive Computing, Inc. PA1OE V2.0 (708) 574-3399
SCHEDULED REPORT
Monitor Level: ALL LINE
Protocol: LAPB m8/X.25
Baud Rate: 19200
Code Set: ASCII
Report Time: TUE 04/03/90 09:25:38
Last Reset: TUE 04/03/90 09:25:11
Layer 2
RR Frames
Host Remote
165 165
Info Frames
Host Remote
164 166
Rejects
Host Remote
0 0
Characters
Host Remote
4235 4487
Logical Channel Usage
Average SVC Setup time 0.08 seconds
Average SVC Setup time plus both direction text time 0.15 seconds
Average SVC Holding time 0.53 seconds
Standard deviation of Holding time at TUE 04/03/90 09:25:15 was 0.03 seconds
Maximum Holding time 0.59 seconds
Number of LCN Calls completed 40
Response Time Information
Average host resident time 0.12 seconds
Average host time plus both direction text time 0.18 seconds
Average total response time 0.02 seconds
Standard deviation of response time at TUE 04/03/90 09:25:16 was 0.21 seconds
Maximum response time 41
Number of transactions above 5.00 seconds 0
Line Utilization
Using all chars on line Host 7.6 %
Using chars in I-Frames only Host 6.5 %
Using chars in I-Frames only Host 1452
Using chars in I-Frames only Host 32
Effective Baud Rate Host 34
Average Data Packet Length Host 123
Standard Deviation of Length Host 180.00
Number of Data Packets over Remote 8.0 %
Remote 6.9 %
Remote 1827
Remote 24
Remote 35
Remote 124
seconds
Transactions not included if over
Host Data Packets Histogram
Interval Number %
0 - 16 44 35.8
16 - 32 44 35.8
32 - 48 6 4.9
48 - 64 7 5.7
64 - 80 4 3.3

Easy-to-read reports can be output automatically to Epson or HP compatible printers

PA1 Performance Analyzer



Line chart shows response times and transaction levels graphed over 2 hour, 8 hour or 24 hour periods and lets you see peak and low-use trends

PC integration:

- Lotus 1-2-3® interface built-in
- Dozens of popular PC printers supported, such as Epson FX, LX or MX; Hewlett-Packard LaserJet and LaserJet Series II; IBM ProPrinter, and more besides basic TTY.
- Built-in ASCII file export capability

General features

- Familiar look, feel and keyboard of industry standard computer
- DOS compatible, fits easily in a laptop for portability
- Reports on screen can be printed easily
- Buffer can be cleared with the touch of a button
- Available as an add-in card or integrated in laptop 286 and 386 computers

Break out box:

Built in software breakout box displays all data and clock leads, as well as major modem and signal leads. Pulse detection traps and displays fast changes. Leads monitored: TxD, RTS, DTR, OOS, RxD, CTS, DSR, DCD, EQM, TxC, RxC, RI.

System requirements:

- IBM PC, XT, AT or compatible
- 512K bytes memory minimum
- One free 8 or 16 bit expansion slot (for line interface card)
- DOS version 2.1 or higher
- Free i/o address (200H or 300H)
- Free interrupt vector (selectable 2-7)
- Optional graphics adapter card (CGA, EGA, VGA or Hercules) to display the PA1 graphic reports.

Speeds:

Standard Operation (full-duplex): 64 KB (19.2 KB when used with LM1)

Progressive Computing — New Visions in Communication

Progressive Computing was founded to create PC-based equipment that provides alternatives to the expense and limitations of dedicated test and communications instruments.

We back the hardware components of all our products with a limited one-year warranty.

For more information about the PA1 Performance Analyzer call us at 708/574-3399.

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LM1 Olympic™ EDITION

Protocol Analyzer

PC-Based Troubleshooting Tool for Monitoring and Analysis

The LM1 Olympic Edition™ Protocol Analyzer puts the power of a dedicated 72KB analyzer in a personal computer. It gives you the flexibility you expect from a PC along with powerful analysis so you can identify errors and diagnose problems quickly.

The LM1 Olympic Edition offers unsurpassed performance. Among its key features is PowerView, which lets you look at layer 2 and layer 3 plain English decodes in real time.

The Olympic offers flexible filtering that helps you quickly zero in on problems, even on heavily loaded SS7 lines and T1 channels. Precapture Filters can independently exclude or include frames based on matching character strings or Layer 2 and 3 mnemonics. You can also specify by type of frame, address or other characteristic such as logical channel number. Precapture Filters can trigger these actions: Count, Buffer (Before, After, or About), Snapshot and Include/Exclude. The Olympic will also Snapshot or Buffer data on error.

Handy in a laptop, the LM1 Olympic Edition lets you use a flexible protocol analyzer weighing less than 18 lb

Protocol Trace filters the display of captured data in a similar manner. Frames can be reviewed by address, frame type or other characteristic. Filter before or after you collect data, but the LM1 Olympic Edition lets you zero in quickly on what you want to see.

The LM1 Olympic Edition:

- Monitors data at 72KB for RS-232, V.35, V.10, V.11, T1 (DS0)
- Supports X.25, SNA, QLLC, Q.931, SS7 and other protocols
- Decodes to Layer 3 real-time in plain English via PowerView
- Interprets every meaningful part of bit-oriented protocols
- Continuously monitors data while in review mode
- Displays twice as much data as stand-alone analyzers
- Logs to the PC's disk at speeds of 72 KB
- Filters data using up to 6 simultaneous traps, which can be set using strings or Layer 3 mnemonics, and by address, type of frame or other characteristic
- Makes test building simple even for nonprogrammers via the PowerScript Custom Test Builder
- Provides easy-to-use selection menus
- Offers laptop portability
- Includes context-sensitive help
- Optional Basic and C

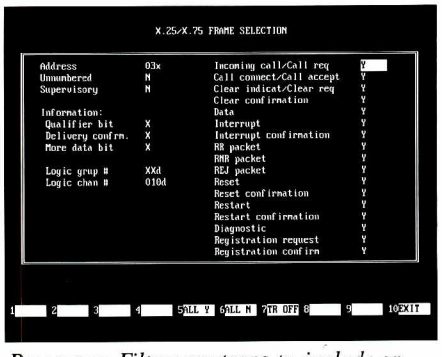
Testing with the Olympic Edition is automated with built-in BERT/BLERT capabilities to 72KB.

The Olympic with its sophisticated programming tools, such as the PowerScript Custom Test Builder, is easy to use and flexible in meeting protocol analysis needs for software developers and network control technicians. For more advanced programming, the Olympic also supports BASIC or C.

The LM1 Olympic Edition gives you easy-to-read interpretations spelled out in plain English, without missing a *bit*, in the exact language from the standards.

Display:

- Up to 1600 mnemonic characters can be displayed using standard EGA monitor
- Any IBM PC compatible color, monochrome or graphics display can be used
- PowerView shows Level 2 and Level 3 plain English decodes in real time
- EGA mode doubles amount of data on screen when using PowerView
- Data Display Modes: Mnemonic, Level 2, Level 2&3, Level 3 Information (Frame, Character, Hexadecimal), Hexadecimal, Character
- Formats: Full Duplex, Half duplex, Data/Modem Lead State Display (an oscilloscope-like trace showing modem lead states)



Precapture Filter uses traps to include or exclude frames based on address or type

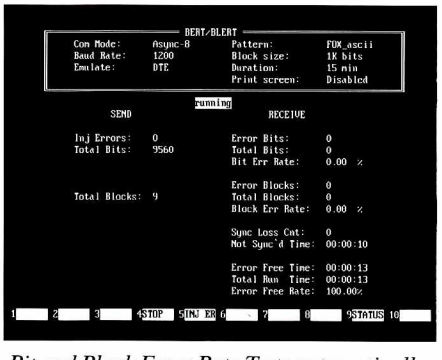
Analysis:

- Number of characters, errors reported in real-time
- Elapsed time and summary information reported automatically in buffer review mode. No programming required
- TX and RX line configurations independently selectable, for checking protocol converters
- PowerScript Custom Test Builder makes powerful, customized test routines easy to write
- Experienced programmers may choose optional PCI BASIC or C library interface

LM1 Olympic™ EDITION

BERT/BLERT:

- 9 patterns: FOX (ASCII or EBCDIC); pseudorandom 63, 511, or 2047; Alternating 01, Mark, Space or user defined — or emulation message
- Block sizes: 256, 512, 1K, 2K, 3K, 5K bits or CCITT/length of pattern
- Async flow control, XON/XOFF or modem leads
- Communications Mode: Async (5, 6, 7, 8 bits) or Sync
- 50 bps to 72 KBPS (same as monitor)
- Emulate DCE or DTE
- Report via printout or log to disk on error, completion, both, or every 1, 5, 10, 30 or 60 minutes
- Screen reports injected error count, total bits and blocks transmitted/ received, errors received, calculated bit and block error rates, sync lost count, not synced time, total run time, error free rate



Bit and Block Error Rate Tests automatically track and report 12 different statistics

General features:

- Familiar look, feel and keyboard of industry standard personal computer
- DOS compatible, captured data can be viewed on any PC
- LAN compatible. When installed on a file server, accessible from multiple stations
- Line configuration files can be saved and subsequently loaded from startup
- Dual tasking — leave LM1 Olympic Edition running while you execute DOS commands such as DIR, COPY, or other programs such as a communications package (DOS 3.0 or higher recommended)
- Autoconfiguration to line speed, protocol, character set
- Context sensitive help

Standard Software:

- Layer 2 frame decode for SDLC/ HDLC, DDCMP and LAPD-ISDN
- PowerScript Custom Test Builder allows custom test procedures and simulations to be written easily
- Bit and Block Error Rate Testing
- Built-in software break-out box
- Built-in async terminal emulation using XMODEM file transfer

Software Options:

- Optional software adds Layer 3 for SNA, X.25, QLLC, ISDN Q.931 and SS7. Real time decodes with precapture and review filtering
- Remote operation for analyzing off-site lines via modem-to-modem connection, with all capabilities supported and dialback password security
- C Programmers' Tool Kit for custom analysis and simulations uses off-the-shelf compilers from Borland, Lattice and Microsoft
- BASIC programming language for custom analysis and simulations in an industry standard BASIC language, enhanced for communications programming

PowerScript Custom Test Builder simplifies test procedures and simulations

Operating Characteristics

Protocols:

X.25/X.75, SNA, QLLC, SS7, HDLC, SDLC, Bisync, DDCMP, TRANSD, async and ISDN including Q.931 generics for CCITT, AT&T, Northern Telecom, Siemens, German, French and Australian. AT&T X.25 on SAPI 0 is also supported

Speeds:

50 bps to 72 kbps

Data Communications Modes:

Asynchronous, Byte and Bit Synchronous, Frame-NRZ, Internal/ External clock independently selectable from configuration screen

Bellcore Signalling System 7 Decode, Serial #:4323
Progressive Computing, Inc. Copyright (C) 1990
18 10001001 Address Indicator
Global Title Indicator: Global title includes type only
19 00000000 Subsystem Number: SSN not known/not used
Global Title: 0010
20 11111110 Translation Type
21 00001000 Digit 8 Digit 0
22 00110000 Digit 0 Digit 3
23 01100101 Digit 5 Digit 6
24 00000101 Variable Mandatory Parm Length: 5
25 11000011 Address Indicator
Global Title Indicator: No global title included
26 11111110 Subsystem Number: 800 number translation
27 00000001 Signalling Point Code: Network Cluster Member
28 00000010 Network Cluster
29 00000001 Network ID
30 00010111 Variable Mandatory Parm Length: 23
User Data / TCAP
31 11100001 Identifier class: National TCAP/Private TCAP, Constructor
Package Type Identifier: Unidirectional
8 BSN:17 FSN:12 | MSU SCCP UDT
1NEXT 2PREV 3 4 5 6 7 8PR DSK 9 10EXIT

The LM1 Olympic Edition supports SS7 decodes at high speeds and under heavy line utilization

Protocol Analyzer

Character Sets:

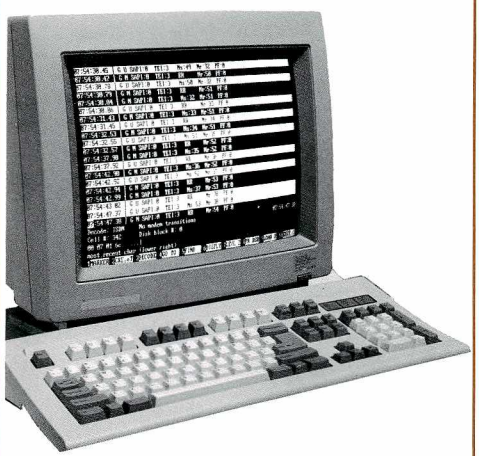
ASCII, EBCDIC, User, Baudot, IPARS0, IPARS1. Data Bits: 5, 6, 7, or 8. *Parity:* None, Even, Odd, or Ignore

Error Checking:

CRC-16, CRC-CCITT

Modem Leads Monitored:

DTE: DTR, RTS. *DCE:* DSR, CTS, DCD, RI. *Lead changes kept in buffer:* DCD, RI, DSR, CTS, DTR, pins 11 and 25



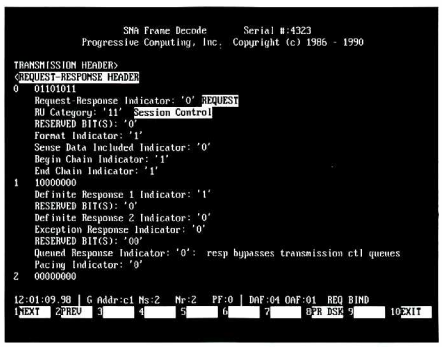
The LM1 Olympic Edition puts the power of a dedicated protocol analyzer in a personal computer

Time Stamping:

Each character and modem lead change is time stamped as it is placed in the buffer. Timer resolution is about 500 microsec

Buffer:

Capacity: PC dependent. RAM buffer stores 32K characters. Mass storage extends buffer limit to PC's disk capacity. Disk wrap feature allows user to specify buffer size, and LM1 Olympic Edition will rewrite buffer continuously while monitoring, saving only the most recent data


SNA Frame Decode Serial #:4323
Progressive Computing, Inc. Copyright (c) 1986 - 1990
TRANSMISSION HEADER>
<REQUEST-RESPONSE HEADER
0 01101011
Request-Response Indicator: '0' REQUEST
RU Category: '11' Session Control
RESERVED BIT(S): '0'
Format Indicator: '1'
Sense Data Included Indicator: '0'
Begin Chain Indicator: '1'
End Chain Indicator: '1'
1 10000000
Definite Response 1 Indicator: '1'
RESERVED BIT(S): '0'
Definite Response 2 Indicator: '0'
Exception Response Indicator: '0'
RESERVED BIT(S): '00'
Queued Response Indicator: '0': resp bypasses transmission ctl queues
Pacing Indicator: '0'
2 00000000
12:01:09.98 | G Addr:ci Ns:2 Nr:2 PF:0 | DAF:04 OAF:01 REQ BIND
1NEXT 2PREV 3 4 5 6 7 8PR DSK 9 10EXIT

LM1 Olympic Edition interprets every meaningful part of bit oriented protocols into plain English

Hardware Description:

- 1 line interface circuit board with RS-232 interface, fits in standard PC-XT/AT bus slots and features onboard 16 MHz 80186 processor with 512K RAM onboard
- 1 3-way flat ribbon RS-232 cable
- Optional V.35 monitor/transmit interface pod
- Optional T1 drop/insert interface pod

System Requirements:

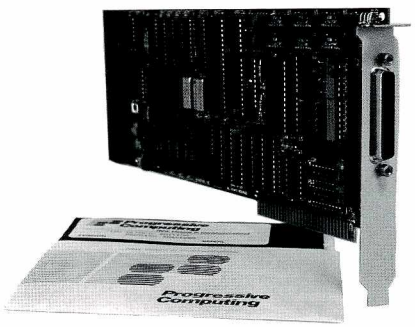
- IBM PC/XT, AT or compatible; AT and hard-disk recommended
- 512K bytes memory minimum, 640K recommended
- One free full-size 8 or 16 bit expansion slot (for line interface card)
- DOS version 2.1 or higher, 3.0 or higher recommended
- Free i/o address (200H or 300H)
- One free 64K byte high memory segment (above 640K)

Interface Options:

- Standard RS-232 and Mil 188 on-board (requires no pod)
- V.35/V.10/V.11 Interface Pod with LED display of clock and data leads
- T1 Interface Pod with DS0 drop and insert capability and testing for T1 framing and 7 other alarm conditions

Warranty:

- Limited one year parts and labor warranty
- Free loaner if unit requires service
- Free telephone support
- One year free software updates
- 15 day free trial
- Optional 1-year or 3-year warranty extension



LM1 Olympic Edition has an RS-232 interface, fits in standard PCs and features an onboard 16 MHz 80186 processor with 512K RAM

Progressive Computing — New Visions in Communications

Progressive Computing was founded to create PC-based equipment that provides alternatives to the expense and limitations of dedicated test and communications instruments.

For more information about the LM1 Olympic Edition Protocol Analyzer call us at 708/574-3399.

Progressive Computing

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Fax: (708) 574-3703
Customer Support Bulletin Board
(708) 574-3688

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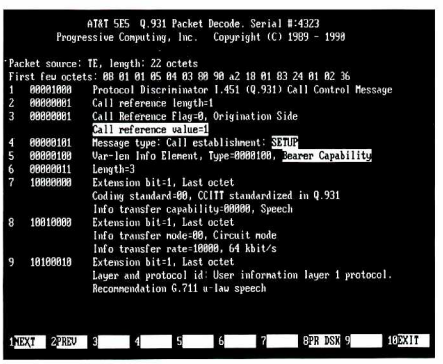
ISDN tel/**scope**®

Specialized testing for ISDN

The ISDN tel/**scope** is a PC-based protocol analyzer dedicated to performance in the ISDN environment. It combines the features of a powerful 72KB protocol analyzer, with on-board hardware interfaces and software tailored for ISDN testing. The ISDN tel/**scope** gives you the performance and the flexibility needed to identify errors and diagnose problems quickly.


AT&T 5E5 Q.931 Packet Decode. Serial #:4323
Progressive Computing, Inc. Copyright (C) 1989 - 1990
Packet source: TE, length: 22 octets
First few octets: 08 01 01 05 04 03 80 90 a2 18 01 83 24 01 82 36
1 00001000 Protocol Discriminator 1.451 (Q.931) Call Control Message
2 00000001 Call reference length=1
3 00000001 Call Reference Flag=0, Origination Side
Call reference value=1
4 00000101 Message type: Call establishment: SETUP
5 00000100 Var-len Info Element, Type=0000100, Bearer Capability
6 00000011 Length=3
7 10000000 Extension bit=1, Last octet
Coding standard=00, CCITT standardized in Q.931
Info transfer capability=00000, Speech
8 10010000 Extension bit=1, Last octet
Info transfer mode=00, Circuit mode
Info transfer rate=10000, 64 kbit/s
9 10100010 Extension bit=1, Last octet
Layer and protocol id: User information layer 1 protocol.
Recommendation G.711 u-law speech
1NEXT 2PREV 3 4 5 6 7 8PR DSN 9 10EXIT

ISDN protocols are interpreted with exact language from the standards

Among the ISDN tel/**scope**'s key features is PowerView, which lets you look at layer 2 and layer 3 decodes in real time, while continuing to capture data. Interpretations are spelled out in plain English, using the exact language from the standards. PowerView is particularly useful when trouble-shooting switch configurations, faulty CPE or user procedures.

The ISDN tel/**scope** offers unparalleled packet decode capabilities including X.25/X.75, CCITT Q.921, and Primary and Basic Rate Q.931 with AT&T, Northern Telecom (stimulus and functional signaling), Siemens, German 1TR6, French and Australian extensions. Built-in support for the Northern Telecom Digital Test Access is also included. Optional decodes for general purpose testing make the ISDN tel/**scope** a versatile and cost-effective tool.

ISDN tel/**scope** features

- ISDN 2B+D S/T interface (192KB)
- B- or D-channel protocol support for ISDN Basic and Primary Rate
- Layer 3 real-time plain English decodes via PowerView
- Pre-capture and review filters
- General purpose data monitoring at 72KB for RS-232, V.24, V.35, V.10, V.11, T1 (DS0), and CEPT 2 megabit
- Monitor and data display at 72KB including log to disk
- Interprets every part of bit-oriented protocols
- Makes custom test building simple via PowerScript
- Rate adaption for V.110* and V.120*
- Includes context-sensitive help
- Optional BASIC and C Programmer's Toolkit

Flexible filtering makes detailed analysis faster and easier by tracing data on elements such as TEI, SAPI, and X.25 logical channels. Pre-capture filters, with up to six real-time traps, can independently include or exclude frames based on matching character strings or layer 2 and layer 3 mnemonics. You can also specify by type of frame, address, logical channel number or other characteristic. Pre-capture filters can trigger actions including Count, Buffer (Before, After, or About), Snapshot and Include/Exclude. Snapshot and Buffer can also be triggered on error. Protocol Trace filters the display of captured data. Frames can be reviewed by address, frame type or other characteristics.

*The ISDN tel/**scope** combines performance and portability*

In addition to its extensive data analysis functions, the ISDN tel/**scope** provides access to voice traffic on the ISDN basic rate B channel. The telephone handset provided with each ISDN tel/**scope** plugs into the standard RJ11 jack on the unit's circuit board, allowing voice monitoring over the ISDN line.

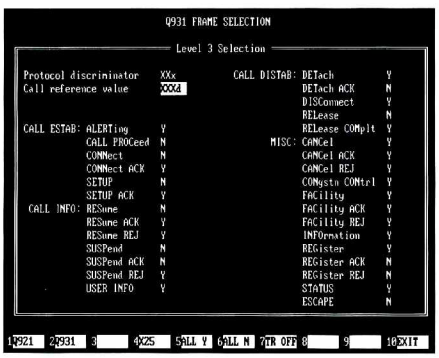
PowerScript is a flexible, interactive custom test builder that meets the specialized testing needs of the ISDN environment. For more advanced programming, ISDN tel/**scope** offers optional BASIC and C Programmer's Toolkit.

* Available first quarter 1991

ISDN tel/**scope**

ISDN Analysis

- X.25/X.75, CCITT Q.921, Q.931 with AT&T (5E4, 5E5, 5E6*), Northern Telecom (stimulus and functional signaling), Siemens, German 1TR6, French and Australian extensions
- B-channel data and voice can be streamed to and from memory
- ISDN software breakout box shows link status (G & F states) and B- and D-channel activity
- Audio monitoring in both directions
- True digital milliwatt



Precapture filters can independently include or exclude frames to be captured. The display of captured data can also be filtered for review

General features:

- PowerView shows Level 2 and Level 3 plain English decodes in real time
- PowerScript Custom Test Builder makes powerful, customized test routines easy to write
- Dual tasking - leave ISDN tel/**scope** running while you execute DOS commands such as DIR, COPY, or other programs such as a communications package (DOS 3.0 or higher recommended)
- Autoconfiguration to line speed, protocol, character set
- LAN compatible. When installed on a file server, accessible from multiple stations
- Line configuration files can be saved and subsequently loaded from startup
- DOS compatible, captured data can be viewed on any PC

ISDN tel/**scope** protocol support

Standard decodes

- X.25/X.75
- CCITT Q.921
- Q.931 with AT&T (5E4, 5E5, 5E6*), Northern Telecom (stimulus and functional signaling), Siemens, German 1TR6, French and Australian extensions
- Primary Rate

Optional decodes

- SNA
- QLLC
- SS7

- Familiar look, feel and keyboard of industry standard personal computer
- Context sensitive help
- Drop-down menus
- RS-232 software breakout box
- Number of characters, errors reported in real-time
- Elapsed time and summary information reported automatically in buffer review mode. No programming required
- Layer 2 frame decode for SDLC/HDLC, DDCMP and LAPD-ISDN
- TX and RX line configurations independently selectable, for checking protocol converters

Display:

- Any IBM PC compatible color, monochrome or graphics display can be used
- Up to 1600 mnemonic characters can be displayed using standard EGA monitor
- EGA mode doubles amount of data on screen when using PowerView
- Data Display Modes: Mnemonic, Level 2, Level 2&3, Level 3 Information (Frame, Character, Hexadecimal), Hexadecimal, Character
- Formats: Full Duplex, Half duplex, Data/Modem Lead State Display (an oscilloscope-like trace showing modem lead states)

BERT/BLERT:

- 9 patterns: FOX (ASCII or EBCDIC); pseudorandom 63, 511, or 2047; Alternating 01, Mark, Space or user defined — or emulation message
- Block sizes: 256, 512, 1K, 2K, 3K, 5K bits or CCITT/length of pattern
- Async flow control, XON/XOFF or modem leads
- Communications Mode: Async (5, 6, 7, 8 bits) or Sync
- 50 bps to 72 KBPS (same as monitor)
- Emulate DCE or DTE
- Report via printout or log to disk on error, completion, both, or every 1, 5, 10, 30 or 60 minutes
- Screen reports injected error count, total bits and blocks transmitted/received, errors received, calculated bit and block error rates, sync lost count, not synced time, total run time, error free rate

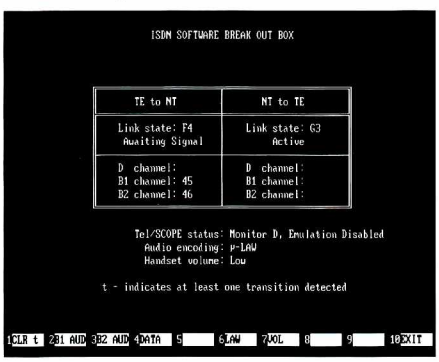
Operating Characteristics

Speeds:

50 bps to 72 kbps

Data Communications Modes:

Asynchronous, Byte and Bit Synchronous, Frame-NRZ, Internal/External clock independently selectable from configuration screen



The ISDN soft breakout box shows link status and B- and D-channel activity

* Available first quarter 1991

PowerScript custom test builder simplifies test procedures and simulations

Character Sets:

ASCII, EBCDIC, User, Baudot, IPARS0, IPARS1. *Data Bits:* 5, 6, 7, or 8. *Parity:* None, Even, Odd, or Ignore

Error Checking:

CRC-16, CRC-CCITT

Modem Leads Monitored:

DTE: DTR, RTS. *DCE:* DSR, CTS, DCD, RI. *Lead changes kept in buffer:* DCD, RI, DSR, CTS, DTR, pins 11 and 25

Time Stamping:

Each character and modem lead change is time stamped as it is placed in the buffer. Timer resolution is about 500 microsec

Buffer:

Capacity: PC dependent. RAM buffer stores 32K characters. Mass storage extends buffer limit to PC's disk capacity. Disk wrap feature allows user to specify buffer size, and ISDN tel/**scope** will rewrite buffer continuously while monitoring, saving only the most recent data

Software Options:

- Optional software adds Layer 3 for SNA, QLLC, and SS7. Real time decodes with precapture and review filtering
- Remote operation for analyzing off-site lines via modem-to-modem connection, with all capabilities supported and dialback password security
- C Programmers' Tool Kit for custom analysis and simulations uses off-the-shelf compilers from Borland, Lattice and Microsoft
- BASIC programming language for custom analysis and simulations in an industry standard BASIC language, enhanced for communications programming
- B-channel data monitoring
- Rate adaption for V.110
- Rate adaption for V.120

Hardware Description

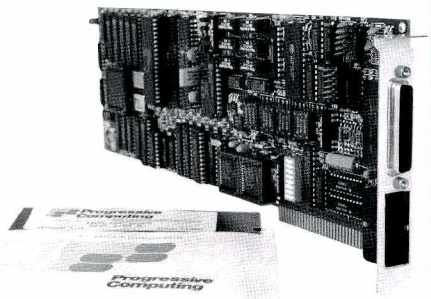
- One Line Interface circuit board with RS-232 interface, RJ45 jack for BRI access, and RJ11 jack for voice monitoring. The circuit card fits in standard PC-XT/AT bus slots and features on-board 16 MHz 80186 processor with 512K RAM on board.
- One 3-way flat ribbon RS-232 cable
- One ISDN tap (RJ45) cable
- One telephone handset
- Optional T1 Interface Pod with DS0 drop and insert capability and testing for T1 framing and 7 other alarm conditions
- Optional V.35/V.10/V.11 Interface Pod with LED display of clock and data leads

System Requirements:

- IBM AT or compatible; hard-disk recommended
- 640K bytes memory minimum
- One free full-size 8 or 16 bit expansion slot (for line interface card)
- DOS version 2.1 or higher, 3.0 or higher recommended
- Free I/O address (200H or 300H)
- One free 64K byte high memory segment (above 640K)
- ISDN S/T line terminated with RJ45

Warranty:

- Limited one year parts and labor warranty
- Free loaner if unit requires service
- Free telephone support
- One year free software updates
- 15 day free trial
- Optional 1-year or 3-year warranty extension



*The ISDN tel/**scope** PC-based protocol analyzer is dedicated to performance in the ISDN environment*

Progressive Computing

Progressive Computing — New Visions in Communications

Progressive Computing was founded to create PC-based equipment that provides alternatives to the expense and limitations of dedicated test and communications instruments.

For more information about the ISDN tel/**scope** call us at 708/574-3399.

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